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EXAMINER	
NGO, TANYA T	

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2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,055	KIKUSHIMA ET AL.	
	Examiner	Art Unit	
	TANYA NGO	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *2,9 and 15-23* is/are withdrawn from consideration.

5)☒ Claim(s) *1,3-8,10-14 and 31* is/are allowed.

6)☒ Claim(s) *24-30 and 32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 23-33 have been considered but are moot in view of the new ground(s) of rejection.

Re claims 24-33, applicant's new added claims 24-33 fully correspond to claims 15-23, wherein the rejection made on claims 15-23 are traversed. However, claims 15-23 were never rejected due to the fact that they were cancelled by an Examiner's Amendment during the interview. This being the case, the following is the rejection of said claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farina US Patent 5,515,199 and Koichi et al (herein Koichi) JP 06-104867, and Roberts et al (herein Roberts) US Patent 7,200,339 B1.

Re claim 24, Farina discloses an optical transmitting device of modulating an optical signal by a first signal and then by a second signal for transmission, the device comprises:

an optical splitting means for splitting the optical signal modulated by the first signal *(the optical signal is input into a modulator 52 and is modulated with signals S in the main modulator, 54. The modulated main optical signal is split in the modulator into two parts at the*

output of the modulator, wherein part of the signal S + distortion propagates down one path and , Fig 5, and a portion of the main modulated optical beam is also tapped and detected by photodetector 65, Fig. 5, Col 4, lines 47-49), the optical signal modulated by the first signal including one or more harmonic distortions of the first signal *(the main optical signal contains all the components S and includes distortion, Fig. 5. Furthermore, the present system is drawn toward correcting harmonic distortions, therefore the distortion in the system comprises of harmonic distortion)*;

a cancellation signal generating means for generating a cancellation signal from one of the split optical signals *(a portion of the RF signal extract at tap 60 and presented to signal combiner 63 and a portion of the main modulated optical be is tapped and detected by photodetector 65 and presented to the combiner to generate a difference signal to be input into the correction modulator 54, Fig 3, Col 4, lines 39-54 to make a -distortion signal, Fig. 3, which is a cancellation signal)*.

Farina discloses the generation of a cancellation signal. Farina does not appear to explicitly disclose a first modulating means for modulating the other of the split optical signals with the cancellation signal. However, Roberts discloses a complex modulator 16 receives a modified input signal 34 which modulates optical signal 14 using the modified input signal 34 to cancel detected noise (Col 5, lines 62-65). Farina and Roberts are analogous art because they are from the same field of endeavor, feed-forward error correction. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Roberts before him or her, to modify the feed forward system of

Farina to include the modulator of Roberts because it allows for the input signal to modulate with the cancellation signal at the transmitter.

Farina does not appear to explicitly disclose a second modulating means for modulating the modulated optical signal with the second signal. However, Kochi discloses plural optical modulators 2-1 to 2-n for performing light intensity modulation with electric signals from the corresponding signal order corresponding to the respective signal source 1-1 to 1-n are provided where the optical modulators are cascade arranged so as to successively from the light intensity modulation. Farina and Kochi are analogous art because they are from the same field of endeavor, optical transmitters. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Kochi before him or her, to modify the transmitter of Farina to include the another modulator cascade arranged along the optical signal of Kochi because it allows for one light source to be used to achieve a frequency multiplexed signal, which means the signal is able to carry more information, and noise degradation due to interference of the light concerned at the time of synthesizing signal light from a plurality of light sources is eliminated and is not frequency to limit a using wavelength *(Abstract)*.

Farina disclose that it operates within the RF spectrum range, Col 2, lines 29-31,which is a limited spectrum range. However, Farina and Kochi do not explicitly disclose the cancellation signal including a frequency spectrum at least partially overlapped with a frequency spectrum of the second signal. Since the cancellation signal and the second signal will be operating in a certain frequency spectrum respectively, it would be obvious for one of

ordinary skill in the art as a matter of design choice to have the frequency spectrum of the cancellation signal to partially overlap the frequency spectrum of the signal second to provide an increase capacity within a given frequency spectrum range.

Re claim 27, Farina discloses an optical transmitting method for modulating an optical signal by a first signal and then by a second signal for transmission, the method comprises:

splitting the optical signal modulated by the first signal *(the optical signal is input into a modulator 52 and is modulated with signals S in the main modulator, 54. The modulated main optical signal is split in the modulator into two parts at the output of the modulator, wherein part of the signal S + distortion propagates down one path and , Fig 5, and a portion of the main modulated optical beam is also tapped and detected by photodetector 65, Fig. 5, Col 4, lines 47-49)*, the optical signal modulated by the first signal including one or more harmonic distortions of the first signal *(the main optical signal contains all the components S and includes distortion, Fig. 5. Furthermore, the present system is drawn toward correcting harmonic distortions, therefore the distortion in the system comprises of harmonic distortion)*;

generating a cancellation signal from one of the split optical signals *(a portion of the RF signal extract at tap 60 and presented to signal combiner 63 and a portion of the main modulated optical be is tapped and detected by photodetector 65 and presented to the combiner to generate a difference signal to be input into the correction modulator 54, Fig 3, Col 4, lines 39-54 to make a -distortion signal, Fig. 3, which is a cancellation signal)*.

Farina discloses the generation of a cancellation signal. Farina does not appear to explicitly disclose a modulating the other of the split optical signals with the cancellation signal. However, Roberts discloses a complex modulator 16 receives a modified input signal 34 which modulates optical signal 14 using the modified input signal 34 to cancel detected noise (Col 5, lines 62-65). Farina and Roberts are analogous art because they are from the same field of endeavor, feed-forward error correction. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Roberts before him or her, to modify the feed forward system of Farina to include the modulator of Roberts because it allows for the input signal to modulate with the cancellation signal at the transmitter.

Farina does not appear to explicitly disclose modulating the modulated optical signal with the second signal. However, Kochi discloses plural optical modulators 2-1 to 2-n for performing light intensity modulation with electric signals from the corresponding signal order corresponding to the respective signal source 1-1 to 1-n are provided where the optical modulators are cascade arranged so as to successively from the light intensity modulation. Farina and Kochi are analogous art because they are from the same field of endeavor, optical transmitters. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Kochi before him or her, to modify the transmitter of Farina to include the another modulator cascade arranged along the optical signal of Kochi because it allows for one light source to be used to achieve a frequency multiplexed signal, which means the signal is able to carry more information, and noise

degradation due to interference of the light concerned at the time of synthesizing signal light from a plurality of light sources is eliminated and is not frequency to limit a using wavelength *(Abstract)*.

Farina disclose that it operates within the RF spectrum range, Col 2, lines 29-31,which is a limited spectrum range. However, Farina and Kochi do not explicitly disclose the cancellation signal including a frequency spectrum at least partially overlapped with a frequency spectrum of the second signal. Since the cancellation signal and the second signal will be operating in a certain frequency spectrum respectively, it would be obvious for one of ordinary skill in the art as a matter of design choice to have the frequency spectrum of the cancellation signal to partially overlap the frequency spectrum of the signal second to provide an increase capacity within a given frequency spectrum range.

4. Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farina, Roberts, and Kochi as applied to claims 24 and 27 above, and further in view of Velazquez et al (herein Velazquez) US Patent 6,473,013.

Re claim 25, Farina, Roberts, and Kochi disclose all the elements of claim 24, which claim 25 is dependent upon. Furthermore, Farina discloses wherein the cancellation signal generating means comprises:

a photoelectric converting means for converting the one of the split signals to an electrical signal *(a portion of the main modulated optical beams is tapped and detected by the photodetector 65, Fig. 5, Col 4, lines 47-49)*;

a filter means for extracting an electrical signal *(signal combiner 63, Fig. 5, outputs a difference signal between the main modulator and the input signal, Col. 4, lines 40-54. The difference between the two signals input into the combiner is the distortion that is present in the system, which includes harmonic distortion. The difference signal is an electrical signal.)*.

Farina does not appear to explicitly disclose a phase adjustment means for adjusting a phase of the extracted electrical signal. However, Velazquez discloses a compensation circuit 250 that includes linearity compensation to reduce harmonic distortions followed by multiple rate filters 260, Fig. 3. The multiple filters 260 can be used to adjust the gain and phase of the signals to compensate for gain or phase mismatch errors. Farina and Velazquez are analogous art because they are from the same field of endeavor, harmonic distortion compensation. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Velazquez before him or her, to modify the cancellation circuit of Farina to include the mismatch filter of Velazquez because it will adjust the phase of the signals to compensate for phase mismatch errors.

Farina disclose that it operates within the RF spectrum range, Col 2, lines 29-31,which is a limited spectrum range. However, Farina and Kochi do not explicitly disclose the cancellation signal including a frequency spectrum at least partially overlapped with a frequency spectrum of the second signal. Since the cancellation signal and the second signal will be operating in a certain frequency spectrum respectively, it would be obvious for one of ordinary skill in the art as a matter of design choice to have the frequency spectrum of the

cancellation signal to partially overlap the frequency spectrum of the signal second to provide an increase capacity within a given frequency spectrum range.

Re claim 28, Farina, Roberts, and Kochi discloses all the elements of claim 27, which claim 28 is dependent upon. Furthermore, Farina discloses wherein the generating step comprises:

converting the one of the split optical signals to an electrical signal *(a portion of the main modulated optical beams is tapped and detected by the photodetector 65, Fig. 5, Col 4, lines 47-49)*;

extracting an electrical signal *(a portion of the main modulated optical beams is tapped and detected by the photodetector 65, Fig. 5, Col 4, lines 47-49)*.

Farina does not appear to explicitly disclose adjusting a phase of the extracted electrical signal. However, Velazquez discloses a compensation circuit 250 that includes linearity compensation to reduce harmonic distortions followed by multiple rate filters 260, Fig. 3. The multiple filters 260 can be used to adjust the gain and phase of the signals to compensate for gain or phase mismatch errors. Farina and Velazquez are analogous art because they are from the same field of endeavor, harmonic distortion compensation. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Velazquez before him or her, to modify the cancellation circuit of Farina to include the mismatch filter of Velazquez because it will adjust the phase of the signals to compensate for phase mismatch errors.

Farina disclose that it operates within the RF spectrum range, Col 2, lines 29-31,which is a limited spectrum range. However, Farina and Kochi do not explicitly disclose the cancellation signal including a frequency spectrum at least partially overlapped with a frequency spectrum of the second signal. Since the cancellation signal and the second signal will be operating in a certain frequency spectrum respectively, it would be obvious for one of ordinary skill in the art as a matter of design choice to have the frequency spectrum of the cancellation signal to partially overlap the frequency spectrum of the signal second to provide an increase capacity within a given frequency spectrum range.

5. Claims 26 and 29, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farina, Roberts, and Kochi as applied to claims 24 and 27 are above, and further in view of Kikushima US PG PUB 2005/0244155 A1.

Re claim 26 and 29, Farina, Roberts, and Kochi discloses all the elements of claim 25 and 27, which claims 26 and 28 are dependent upon. Farina does not appear to explicitly disclose wherein the first signal is an FM batch converted signal. However, Kikushima discloses that conventionally an optical signal transmitter and an optical signal transmission system employ a method for subjecting video signals to frequency modulation as a single unit, know as FM batch conversion *(paragraph [0002])*. Farina and Kikushima are analogous art because they are from the same field of endeavor, optical transmission of video signal. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina and Kikushima before him or her, to modify the optical

transmitter of Farina to include the FM batch conversion method of Kikushima because it is a conventional practice for video signals, which the CATV signals of Farina are, and it allows one to frequency modulate as a single unit *(paragraph [0002])* reducing the complexity of the circuit.

6. Claims 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farina, Roberts, Kochi, and Kikushima as applied to claims 29 and 26 above, and further in view of Buabbud et al (herein Buabbud) US Patent 6,366,712.

Re claim 30 and 32, Farina, Roberts, Kochi, and Kikushima disclose all the elements of claims 29 and 26, which they are dependent upon, respectively. Farina does not appear to explicitly discloses , wherein the second signal is a satellite broadcasting RF signal. However, Buabbud discloses the combination of two separation RF signals, such as CATV signals and a Direct Broadcasting Satellite signal on a single optical fiber *(Col. 1, lines 9-15)*. Farina and Buabbud are analogous art because they are from the same field of endeavor, optical transmission of CATV signals. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Farina, Kochi, and Buabbud before him or her, to modify the optical transmission system of Farina and Kochi to include the satellite broadcasting RF signal of Buabbud as the second signal because it would be desirable to provide DBS signals to the home other than by an individual satellite dish because of the ever increasing demand of other types of communication techniques *(Col. 1, lines 18-41)*.

Allowable Subject Matter

7. Claims 1, 3-8, and 10-14, 31 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANYA NGO whose telephone number is (571) 270-7488. The examiner can normally be reached on M - F from 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngo/
March 19, 2010

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613